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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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MARTINE PENILLA & GENCARELLA, LLP
710 LAKEWAY DRIVE
SUITE 200
SUNNYVALE, CA 94085

EXAMINER	
CHENG, PETER L	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/688,866	KAKUTANI, TOSHIAKI	
	Examiner	**Art Unit**	
	PETER L. CHENG	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 February 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 February 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. Suggest removing the word "THE" in the title; this was inadvertently not suggested in the previous action; the title would then become: **IMAGE PROCESSING APPARATUS FOR CONVERTING [[~~THE~~]] COLOR DATA BY REFERRING TO A RECONSTRUCTED COLOR CONVERSION TABLE AND AN IMAGE PROCESSING METHOD FOR THE SAME.**

2. The disclosure is objected to because of the following informalities:

- **Page 38, lines 1 - 2:** similar to corrections previously made, suggest replacing "A curve of broken line" with "A curved, dashed line";

- **Page 40, line 21:** likewise, suggest replacing "A curve of broken line" with "A curved, dashed line";

- **Page 40, line 25:** likewise, suggest replacing "curve of broken line" with "curved, dashed line";

- **Page 45, line 14:** similar to corrections previously made, suggest replacing "thin broken line" with "thin, dashed line";

3. The objection to the use of the term "wherein" in claims 1 - 10 is withdrawn.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1 – 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over **KAKUTANI [PCT Pub. No. WO02/32113** corresponding to **US Patent 7,046,844 B2]** in view of **FALK [US Patent Application Publication 2004/0046766 A1]** and **NEWMAN [US Patent 6,023,351]**.

As for claim 1, KAKUTANI (in WO02/32113 / US Patent 7,046,844) teaches an image processing apparatus **[Fig. 1,** computer **10** as an image processing apparatus; **col. 11,**

lines 25 – 26] that converts first image data expressed in a first color system into second image data expressed in a second color system by referring to a color conversion table **[Fig. 1,** color conversion table **15]**, said image processing apparatus comprising:

a color conversion table storage module that stores the color conversion table representing a mapping of second image data expressed in the second color system to multiple lattice points at which first image data generated in a color space of the first color system and expressed in the first color system are registered
[Fig. 1, "tone data conversion module" stores "color conversion table" **15],**

wherein the color conversion table is encoded and represents a mapping of encoded second image data to the multiple lattice points where the encoded second image data are obtained by an encoding process
[KAKUTANI teaches that the color conversion table 15 of the first embodiment "has tone values of the colors CMY set to slightly larger values in the highlight area that are the tone values for which the RGB image data is large. With color conversion table 15 of FIG. 1, the CMY tone values set to larger values in relation to the RGB image data are shown conceptually by a solid line. Small dots are mainly formed in the <u>highlight area, so this is an area where insufficient resolution of the image data shows up easily. In light of this, in this type of area, instead of increasing the resolution, the insufficient resolution is supplemented by</u>

converting to larger image data"; **col. 12, line 58 – col. 13, line 1;** see also, **col. 16, lines 35 – 44.**

KAKUTANI teaches that "the proportionally increased color conversion table can be set easily by changing the image data of the colors CMYK set at the grid points of the color conversion table"; **col. 18, lines 36 – 38.**

As shown in **Fig. 8**, "encoding coefficient Ke is set for the tone values of the image data, and by multiplying the image data of each color CMYK by the encoding coefficient Ke, image data for which the tone values have been proportionally increased is calculated. FIG. 9 shows the situation of the image data being multiplied by the encoding coefficient Ke to calculate the image data for which the tone values have been proportionally increased"; **col. 18, lines 44 – 51.**

The encoding coefficient Ke "function", as given by equation (1) in **col. 18, line 58**, "is set so that in areas that have small values for image data (specifically, the highlighted areas), image data is proportionally increased by about 4 times, and as the image data gets larger, the proportional increase volume decreases. By working in this way, when color conversion is done, in the highlight areas, it is possible to supplement insufficient resolution of the image data"; **col. 18, line 62 – col. 19, line 2],**

which enhances a variation in tone value of the second image data in a predetermined tone area in the first color system while compressing the variation in tone value of the second image data in a residual tone area [Fig. 9; the curved line shows the resulting encoded color data; for CMYK image data values less than approximately 100, the slope of the curve is greater than 1; thereafter, the slope of the curve becomes less than 1; for the first portion of the curve (with slope greater than 1), the variation in tone values is enhanced; for the latter portion (with slope less than 1), the variation in tone values is compressed**];**

~~**an *intermediate table generation module* that makes the color conversion table subjected to a decoding process, *so as to generate an intermediate color conversion table*, where the decoding process restores the variation in tone value enhanced or compressed by the encoding process**~~**;**

~~**a color conversion table reconstruction module that specifies second image data corresponding to multiple lattice points, which are set to include at least different lattice points from lattice points included in the intermediate color conversion table, based on the intermediate color conversion table and makes the specified second image data subjected to the encoding process, so as to reconstruct the intermediate color conversion table and generate a reconstructed color conversion table**~~**;**

a color conversion module that refers to the reconstructed color conversion table to convert the first image data expressed in the first color system into encoded second image data, which has gone through the encoding process
[Fig. 1, color conversion module **14];**

~~and an image data decoding module that makes the encoded second image data subjected to the decoding process to cancel out the encoding process, thus specifying the second image data expressed in the second color system.~~

However, KAKUTANI (in WO02/32113 / US Patent 7,046,844) *does not teach*

an *intermediate table generation module* that makes the color conversion table subjected to a <u>decoding process</u>, *so as to generate an intermediate color conversion table*, where the decoding process restores the variation in tone value enhanced or compressed by the encoding process;

a color conversion table reconstruction module that <u>specifies second image data corresponding to multiple lattice points, which are set to include at least different lattice points from lattice points included in the intermediate color conversion table</u>, based on the intermediate color

> **conversion table and <u>makes the specified second image data subjected to the encoding process</u>, so as to reconstruct the intermediate color conversion table and generate a reconstructed color conversion table;**
>
> **and an image data decoding module that makes the encoded second image data subjected to the <u>decoding process</u> to cancel out the encoding process, <u>thus specifying the second image data expressed in the second color system</u>.**

FALK cites that "one problem with previously known interpolation techniques occurs when one of the second color values saturates at the low end (e.g., output value of 0) or high end (e.g., output value of 255) of the color value scale"; **page 1, paragraph 9, lines 1 – 4.** This is the same problem that KAKUTANI (in WO02/32113 / US Patent 7,046,844) addresses and minimizes by encoding color conversion data with an "encoding coefficient Ke" (as shown in **Fig. 8** as an exponential function; as shown in **Fig. 14** as piece-wise linear).

FALK solves this problem by using a method for "converting a first color value to a second color value without saturation error"; **page 2, paragraph 13, lines 1 – 3.** With respect to **Fig. 3**, "second color values" of an "uncompressed lookup table" are "compressed to form intermediate color values. Certain intermediate color values then are reset to a value determined by a regression that includes adjacent intermediate

color values"; **page 2, paragraph 15, lines 7 – 10.** "After the compressed and modified table is created, it then may be used to convert first colors values to intermediate color values that may subsequently be decompressed to provide second color values"; **page 4, paragraph 45, lines 1 – 4.** As shown in **Fig. 10**, "at step 78, the selected or interpolated intermediate color value is decompressed using an inverse of the compression formula. The result is the second color value"; **page 4, paragraph 45, lines 15 – 17.**

That is, the processes of "encoding" (or "compressing") and "decoding" (or "decompressing") are well-known in the art. Its objective is to minimize the effects of "saturation".

In addition, the process of supplementing a color conversion table with additional points is also well-known in the art. For example, NEWMAN teaches that "certain regions of a device's color space are critical in the sense that good color reproduction is required (such as for flesh tones), or in the sense that large non-linearities occur even with small changes in device color coordinates. For such regions, it is desired to obtain more color patches by decreasing the interval between samples, so as to obtain greater color accuracy and fidelity in these critical regions"; **col. 1, lines 36 – 43.** NEWMAN cites a prior invention that adds data points "in regions of local non-linearities" to "a look-up table based on empirically measured colors together with calculated colors that have not been measured"; **col. 1, lines 55 – 58.**

That is, the objective of supplementing a color conversion table with additional points is to improve color reproduction in regions where “large non-linearities occur even with small changes in device color coordinates”.

Each method, “encoding/decoding” color conversion data and “supplementing” a color conversion table, is directed to solving a separate problem.

Therefore, it is believed that it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of FALK and NEWMAN with those of KAKUTANI (in WO02/32113 / US Patent 7,046,844) so that a base or reference “color conversion table” storing “encoded” (or “compressed”) data is “decoded” (or “decompressed”) at a time when color data is converted from a “first color system” to a “second color system”, as taught by FALK, and when a certain color region requires higher accuracy (as in flesh tones), as taught by NEWMAN, additional lattice points would be added to the base or reference “color conversion table” *after the table is first decoded, thereby, creating a “supplemented color conversion table”.* To minimize saturation, it would have been obvious to re-encode (or “reconstruct”) the “supplemented color conversion table”.

Regarding claim 2, KAKUTANI (in WO02/32113 / US Patent 7,046,844) further teaches an image processing apparatus in accordance with claim 1,

wherein said color conversion module carries out the encoding process to enhance or compress the variation in tone value of the second image data, while keeping a magnitude order of the second image data

[Fig. 8 illustrates an encoding coefficient (Ke) curve which varies from magnitude 4 to magnitude 1. Since the coefficient is at least 1, a "magnitude of order" is maintained.**].**

Regarding claim 3, KAKUTANI (in WO02/32113 / US Patent 7,046,844) *does not teach* an image processing apparatus in accordance with claim 1,

wherein said intermediate table generation module comprises a decode table, which stores a mapping of the encoded second image data to the non-encoded second image data, and said intermediate table generation module refers to the decode table to convert the color conversion table and thereby generate the intermediate color conversion table.

FALK teaches an alternative system where a 1-dimensional look-up table is used to decompress (or "decode") the encoded color data. FALK cites, "Each 1-D LUT module may be used to decompress a single color channel in accordance with methods described above in connection with FIG. 10. Thus, as shown in FIG. 12. 1-D LUT 122 decompresses the 'C' channel, 1-D LUT 124 decompresses the 'M' channel, and 1-D LUT 126 decompresses the 'Y' channel"; **page 5, paragraph 52, lines 5 – 11.**

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a "decode table" to convert encoded color conversion table data into an intermediate (decoded) color conversion table.

Regarding claim 4, KAKUTANI (in WO02/32113 / US Patent 7,046,844) does not specifically teach an image processing apparatus in accordance with claim 1,

> **wherein said color conversion table reconstruction module reconstructs a color conversion table, which has a greater number of lattice points than the number of lattice points included in the intermediate color conversion table.**

However, as noted for claim 1, NEWMAN teaches that a (decoded or uncompressed) color conversion table can be supplemented with additional color data (i.e., lattice points) when color reproduction accuracy is important (as in reproducing flesh tones).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to create an intermediate color conversion table with a greater number of lattice points than the original, base or reference table.

Regarding claim 5, KAKUTANI (in WO02/32113 / US Patent 7,046,844) further teaches an image processing apparatus in accordance with claim 1,

wherein said image data decoding module makes the encoded second image data obtained by said color conversion module subjected to the decoding process as well as conversion into dot density data, which represents a dot formation density with regard to each of various dots having different tone values expressible by a unit dot

As noted for claim 1, FALK teaches a “decoding process” which converts encoded (or compressed) color data into decoded (or decompressed) color data.

KAKUTANI (in WO02/32113 / US Patent 7,046,844) teaches an “un-encoded tone value to dot volume” conversion in **Fig. 7**.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of FALK with those of KAKUTANI (in WO02/32113 / US Patent 7,046,844) so that encoded color data of a second color system could be converted into dot density data.

Regarding claim 6, KAKUTANI (in WO02/32113 / US Patent 7,046,844) further teaches an image processing apparatus in accordance with claim 5,

wherein said image data decoding module comprises a conversion table, which stores a mapping of the encoded second image data to the dot density data obtained by converting the non-encoded second image data,

and said image data decoding module refers to the conversion table to directly convert the encoded second image data obtained by said color conversion module into the dot density data

[Fig. 12 illustrates a conversion which maps the “encoded second image data”, as shown as either the “deformed”, bold, dashed line (for small dots), or the “deformed”, bold, solid line (for large dots), to “non-encoded second image data”, as shown as the corresponding thin, dashed line and thin, solid line, respectively; **col. 21, lines 39 – 51.** This conversion eliminates a step of first converting encoded color data into decoded color data**].**

Regarding claim 7, KAKUTANI (in WO02/32113 / US Patent 7,046,844) further teaches an image processing apparatus in accordance with claim 1,

wherein the first color system is an RGB color system and the second color system is a CMY color system

[KAKUTANI teaches “an example of a case of color conversion of RGB image data into ... CMY colors”; **col. 3, lines 31 - 36].**

Regarding claim 8, KAKUTANI (in WO02/32113 / US Patent 7,046,844) does not specifically teach an image processing apparatus in accordance with claim 1, said image processing apparatus further comprising:

a detection module that detects a setting with regard to a priority order between a conversion accuracy of image data and a conversion speed; and

a prohibition module that prohibits operations of said intermediate table generation module when the setting gives priority to the conversion speed over the conversion accuracy,

wherein said color conversion table reconstruction module uses the stored color conversion table, instead of the intermediate color conversion table generated by said intermediate table generation module, to generate the reconstructed color conversion table, when the setting gives priority to the conversion speed over the conversion accuracy.

However, as noted for claim 1, NEWMAN cites an invention that teaches a method of supplementing a color conversion table so that color reproduction accuracy is improved. NEWMAN also notes that if the color conversion table is supplemented so that the resulting printer LUT is not regular in the sense that the interval between grid points is not fixed, "access to entries in the LUT requires a pre-processing map between a color value and a corresponding address in the LUT, <u>thereby slowing access</u>"; **col. 1, lines 59 – 64.**

That is, NEWMAN identifies a potential trade-off between obtaining conversion accuracy (with a supplemented, intermediate color table) and conversion speed. Higher

accuracy means more processing time, therefore, slower conversion speed. Lower accuracy means less processing time, therefore, faster conversion speed.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a user with the option to emphasize color conversion accuracy instead of conversion speed, or emphasize color conversion speed instead of accuracy. Printer driver user interfaces typically incorporate such a "print quality setting".

As for claim 9, KAKUTANI (in WO02/32113 / US Patent 7,046,844) teaches an image processing method that converts first image data expressed in a first color system into second image data expressed in a second color system by referring to a color conversion table **[**Fig. 1, **color conversion table** 15**]**, said image processing method comprising:

> **a first step of storing the color conversion table representing a mapping of second image data expressed in the second color system to multiple lattice points, at which first image data generated in a color space of the first color system and expressed in the first color system are registered**
> **[Fig. 1,** "tone data conversion module" stores "color conversion table" **15],**
>
> **wherein the color conversion table is encoded and represents a mapping of encoded second image data to the multiple lattice points, where the encoded second image data are obtained by an encoding process**

[KAKUTANI teaches that the color conversion table 15 of the first embodiment "has tone values of the colors CMY set to slightly larger values in the highlight area that are the tone values for which the RGB image data is large. With color conversion table 15 of FIG. 1, the CMY tone values set to larger values in relation to the RGB image data are shown conceptually by a solid line. Small dots are mainly formed in the highlight area, so this is an area where insufficient resolution of the image data shows up easily. In light of this, in this type of area, instead of increasing the resolution, the insufficient resolution is supplemented by converting to larger image data"; **col. 12, line 58 – col. 13, line 1;** see also, **col. 16, lines 35 – 44.**

KAKUTANI teaches that "the proportionally increased color conversion table can be set easily by changing the image data of the colors CMYK set at the grid points of the color conversion table"; **col. 18, lines 36 – 38.**

As shown in **Fig. 8**, "encoding coefficient Ke is set for the tone values of the image data, and by multiplying the image data of each color CMYK by the encoding coefficient Ke, image data for which the tone values have been proportionally increased is calculated. FIG. 9 shows the situation of the image data being multiplied by the encoding coefficient Ke to calculate the image data for which the tone values have been proportionally increased"; **col. 18, lines 44 – 51.**

The encoding coefficient Ke "function", as given by equation (1) in **col. 18, line 58**, "is set so that in areas that have small values for image data (specifically, the highlighted areas), image data is proportionally increased by about 4 times, and as the image data gets larger, the proportional increase volume decreases. By working in this way, when color conversion is done, in the highlight areas, it is possible to supplement insufficient resolution of the image data"; **col. 18, line 62 – col. 19, line 2],**

which enhances a variation in tone value of the second image data in a predetermined tone area in the first color system, while compressing the variation in tone value of the second image data in a residual tone area [Fig. 9; the curved line shows the resulting encoded color data; for CMYK image data values less than approximately 100, the slope of the curve is greater than 1; thereafter, the slope of the curve becomes less than 1; for the first portion of the curve (with slope greater than 1), the variation in tone values is enhanced; for the latter portion (with slope less than 1), the variation in tone values is compressed**];**

~~a second step of making the color conversion table subjected to a decoding process, so as to~~ *~~generate an intermediate color conversion table~~*~~, where the decoding process restores the variation in tone value enhanced or compressed by the encoding process~~;

~~a third step of specifying second image data corresponding to multiple lattice points, which are set to include at least different lattice points from lattice points included in the intermediate color conversion table, based on the intermediate color conversion table and making the specified second image data subjected to the encoding process, so as to reconstruct the intermediate color conversion table and generate a reconstructed color conversion table~~;

a fourth step of referring to the reconstructed color conversion table to convert the first image data expressed in the first color system into encoded second image data, which has gone through the encoding process
[Fig. 1, color conversion module **14];**

~~and a fifth step of making the encoded second image data subjected to the decoding process to cancel out the encoding process, thus specifying the second image data expressed in the second color system.~~

However, KAKUTANI (in WO02/32113 / US Patent 7,046,844) does not teach

a second step of making the color conversion table subjected to a <u>decoding process</u>, so as to *generate an intermediate color conversion*

***table*, where the decoding process restores the variation in tone value enhanced or compressed by the encoding process.**

a third step of specifying second image data corresponding to multiple lattice points, which are set to include at least different lattice points from lattice points included in the intermediate color conversion table, based on the intermediate color conversion table and making the specified second image data subjected to the encoding process, so as to reconstruct the intermediate color conversion table and generate a reconstructed color conversion table;

and a fifth step of making the encoded second image data subjected to the decoding process to cancel out the encoding process, thus specifying the second image data expressed in the second color system.

Please the see discussion for claim 1.

As for claim 10, KAKUTANI (in WO02/32113 / US Patent 7,046,844) teaches ~~a program stored in a computer readable~~ computer-readable storage medium having a program stored thereon, ~~that causes~~ said program including computer-executable instructions for causing a computer to attain an image processing method that converts first image data expressed in a first color system into second image data expressed in a second

color system by referring to a color conversion table **[Fig. 1,** color conversion table **15]**, said program comprising computer-executable instructions causing the computer to execute the following:

a first function of storing the color conversion table representing a mapping of second image data expressed in the second color system to multiple lattice points, at which first image data generated in a color space of the first color system and expressed in the first color system are registered

[Fig. 1, "tone data conversion module" stores "color conversion table" **15],**

wherein the color conversion table is encoded and represents a mapping of encoded second image data to the multiple lattice points, where the encoded second image data are obtained by an encoding process

[KAKUTANI teaches that the color conversion table 15 of the first embodiment "has tone values of the colors CMY set to slightly larger values in the highlight area that are the tone values for which the RGB image data is large. With color conversion table 15 of FIG. 1, the CMY tone values set to larger values in relation to the RGB image data are shown conceptually by a solid line. Small dots are mainly formed in the highlight area, so this is an area where insufficient resolution of the image data shows up easily. In light of this, in this type of area, instead of increasing the resolution, the insufficient resolution is supplemented by

<u>converting to larger image data</u>"; **col. 12, line 58 – col. 13, line 1;** see also, **col. 16, lines 35 – 44.**

KAKUTANI teaches that "the proportionally increased color conversion table can be set easily by changing the image data of the colors CMYK set at the grid points of the color conversion table"; **col. 18, lines 36 – 38.**

As shown in **Fig. 8**, "encoding coefficient Ke is set for the tone values of the image data, and by multiplying the image data of each color CMYK by the encoding coefficient Ke, image data for which the tone values have been proportionally increased is calculated. FIG. 9 shows the situation of the image data being multiplied by the encoding coefficient Ke to calculate the image data for which the tone values have been proportionally increased"; **col. 18, lines 44 – 51.**

The encoding coefficient Ke "function", as given by equation (1) in **col. 18, line 58**, "is set so that in areas that have small values for image data (specifically, the highlighted areas), image data is proportionally increased by about 4 times, and as the image data gets larger, the proportional increase volume decreases. By working in this way, when color conversion is done, in the highlight areas, it is possible to supplement insufficient resolution of the image data"; **col. 18, line 62 – col. 19, line 2],**

which enhances a variation in tone value of the second image data in a predetermined tone area in the first color system, while compressing the variation in tone value of the second image data in a residual tone area **[Fig. 9;** the curved line shows the resulting encoded color data; for CMYK image data values less than approximately 100, the slope of the curve is greater than 1; thereafter, the slope of the curve becomes less than 1; for the first portion of the curve (with slope greater than 1), the variation in tone values is enhanced; for the latter portion (with slope less than 1), the variation in tone values is compressed**];**

~~a second function of making the color conversion table subjected to a decoding process, so as to~~ *~~generate an intermediate color conversion table~~*~~, where the decoding process restores the variation in tone value enhanced or compressed by the encoding process~~;

~~a third function of specifying second image data corresponding to multiple lattice points, which are set to include at least different lattice points from lattice points included in the intermediate color conversion table, based on the intermediate color conversion table and making the specified second image data subjected to the encoding process, so as to reconstruct the intermediate color conversion table and generate a reconstructed color conversion table~~;

a fourth function of referring to the reconstructed color conversion table to convert the first image data expressed in the first color system into encoded second image data, which has gone through the encoding process

[Fig. 1, color conversion module **14];**

~~**and a fifth function of making the encoded second image data subjected to the decoding process to cancel out the encoding process, thus specifying the second image data expressed in the second color system.**~~

However, KAKUTANI (in WO02/32113 / US Patent 7,046,844) does not teach

a second function of making the color conversion table subjected to a <u>decoding process</u>, so as to *generate an intermediate color conversion table*, where the decoding process restores the variation in tone value enhanced or compressed by the encoding process;

a third function of <u>specifying second image data corresponding to multiple lattice points, which are set to include at least different lattice points from lattice points included in the intermediate color conversion table</u>, based on the intermediate color conversion table and <u>making the specified second image data subjected to the encoding process</u>, so as to reconstruct the

intermediate color conversion table and generate a reconstructed color conversion table;

and a fifth function of making the encoded second image data subjected to the decoding process to cancel out the encoding process, thus specifying the second image data expressed in the second color system.

Please see the discussion for claim 1.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter L. Cheng whose telephone number is 571-270-3007. The examiner can normally be reached on MONDAY - FRIDAY, 8:30 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, King Y. Poon can be reached on 571-272-7440. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/King Y. Poon/
Supervisory Patent Examiner, Art Unit 2625

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